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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,981	04/12/2001	Naohito Hanai	108916	8026

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EXAMINER	
MCCARTNEY, LINZY T	
ART UNIT	**PAPER NUMBER**
2671	15

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/786,981	HANAI ET AL.	
	Examiner	Art Unit	
	Linzy McCartney	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,7,9-15 and 17-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,9-15 and 17-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 6, 7, 10, 12-15, 17-19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,054,992 to Gibson in view of U.S. Patent 6,512,516 to Schill further in view of JP 05-101161 to Oka.

a. Referring to claim 1, Gibson discloses means which changes a state of an elemental object among the plurality of elemental objects in accordance with occurrence of an event (column 7, lines 12-19; Fig. 11) and image generation means which generates an image in accordance with a state of an elemental object (column 4, lines 63-64; Fig. 1). Gibson does not explicitly disclose state change propagation means which propagates the state change to another elemental object which belongs to the same aggregate object as the changed elemental object, wherein at least one elemental object has the state change propagation means or wherein after the event has occurred, the state change propagation means determines at random whether a state of an elemental object is changed when a state of another elemental object, which has a predetermined relationship with the elemental object and belongs to the same aggregate object as the elemental object, has changed. Schill discloses state change propagation means which propagates the state change to another elemental object which belongs to the same aggregate object

as the changed elemental object, wherein at least one elemental object has the state change propagation means (column 3, lines 32-40; Table 1). Oka discloses wherein after the event has occurred, the state change propagation means determines at random whether a state of an elemental object is changed when a state of another elemental object, which has a predetermined relationship with the elemental object and belongs to the same aggregate object as the elemental object, has changed (page 10, paragraphs 1-2; page 8, paragraph 3 – page 9, paragraph 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by including state change propagation means wherein at least on elemental object has the state change propagation means as taught by and after the event has occurred determining at random whether a state of elemental object is changed at taught by Schill and Oka respectively. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23) and because it would generate natural-looking animated images (Oka, page 13, paragraph 1).

b. Referring to claim 2, Gibson discloses wherein in the image generation, at least one of shape, color, position, rotation angle, direction, moving direction, and moving speed is changed in accordance with the state change of an elemental object (column 8, lines 36-48; Figs. 17a-17d).

c. Referring to claim 3, Gibson discloses means which changes a state of an elemental object among the plurality of elemental objects in accordance with occurrence of an event (column 7, lines 12-19; Fig. 11) and image generation means which generates an image in accordance with a state of an elemental object (column 4, lines 63-64; Fig. 1). Gibson does not explicitly disclose state change propagation means which propagates the state change to another elemental object which belongs to the same aggregate object as the changed elemental object wherein the state change propagation means comprises; state hold means which holds a state of an elemental object, state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object, and state change means which changes a state of an elemental object when a state of another elemental object which has a predetermined relationship with the elemental object has changed or wherein after the event has occurred, the state change propagation means determines at random whether a state of an elemental object is changed when a state of another elemental object, which has a predetermined relationship with the elemental object and belongs to the same aggregate object as the elemental object, has changed. Schill discloses state change propagation means which propagates the state change to another elemental object which belongs to the same aggregate object as the changed elemental object (column 3, lines 32-40; Table 1) wherein the state change propagation means comprises state hold means which holds a state of an elemental object (Table 1); state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object (column 3, lines 13-20), and state change means which changes a state of an elemental

object when a state of another elemental object which has a predetermined relationship with the elemental object has changed (column 3, lines 32-40; Table 1). Schill also discloses wherein the state change means of the state change propagation means changes the state of the elemental object after a given time has elapsed from the state change of another elemental object (column 3, lines 32-40; column 4, lines 26-50; Table 1). Oka discloses wherein after the event has occurred, the state change propagation means determines at random whether a state of an elemental object is changed when a state of another elemental object, which has a predetermined relationship with the elemental object and belongs to the same aggregate object as the elemental object, has changed (page 10, paragraphs 1-2; page 8, paragraph 3 – page 9, paragraph 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by including state change propagation means wherein at least on elemental object has the state change propagation means and after the event has occurred determining at random whether a state of elemental object is changed at taught by Schill and Oka respectively. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23) and because it would generate natural-looking animated images (Oka, page 13, paragraph 1).

d. Referring to claim 4, Gibson does explicitly disclose wherein the state change means of the state change propagation means changes a state of an elemental object when

a state of another elemental object which has a predetermined positional relationship with the elemental object has changed. Schill discloses wherein the state change means of the state change propagation means changes a state of an elemental object when a state of another elemental object which has a predetermined positional At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by including state change propagation means wherein at least on elemental object has the state change propagation means as taught by as taught by Schill. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23).

e. Referring to claim 6, Gibson does not explicitly disclose wherein the state change means of the state change propagation means changes the state of the elemental object after a given time has elapsed from the state change of another elemental object. Schill discloses wherein the state change means of the state change propagation means changes the state of the elemental object after a given time has elapsed from the state change of another elemental object (column 3, lines 32-40; column 4, lines 26-50; Table 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by changing the state of the elemental object after a given time has elapsed from the state change of another elemental object as taught by Schill. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in

virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23).

f. Referring to claim 7, Gibson does not explicitly disclose wherein the state change propagation means changes a first state of an elemental object into a second state after a given time has elapsed. Schill discloses wherein the state change propagation means changes a first state of an elemental object into a second state after a given time has elapsed (column 3, lines 32-40; column 4, lines 26-50; Table 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by changing a first state of an elemental object into a second sate after a given time has elapsed as taught by Schill. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23).

g. Referring to 10, Gibson discloses wherein the aggregate object is formed by assembling the elemental objects having different shapes without gaps (Fig. 3a – 3c).

h. Program claims 12-15, 17-18, and 21 recites steps performed by apparatus claims 1-4, 6-7, and 10; therefore they are similar in scope and are rejected under the same rationale.

i. Referring to claim 19, Gibson does not explicitly disclose providing the state change propagation means for each elemental object. Schill discloses providing the state change propagation means for each elemental object (column 3, lines 32-40; Table 1). At

the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by providing the state change propagation means for each elemental object as taught by Schill. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23).

3. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson and Schill.

a. Referring to claim 23, Gibson discloses means which changes a state of an elemental object among the plurality of elemental objects in accordance with occurrence of an event (column 7, lines 12-19; Fig. 11) and image generation means which generates an image in accordance with a state of an elemental object (column 4, lines 63-64; Fig. 1). Gibson does not explicitly disclose state change propagation means which propagates the state change to another elemental object which belongs to the same aggregate object as the changed elemental object wherein the state change propagation means comprises; state hold means which holds a state of an elemental object, state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object, and state change means which changes a state of an elemental object when a state of another elemental object which has a predetermined relationship with the elemental object has changed. Schill discloses state change propagation means

which propagates the state change to another elemental object which belongs to the same aggregate object as the changed elemental object (column 3, lines 32-40; Table 1) wherein the state change propagation means comprises state hold means which holds a state of an elemental object (Table 1); state monitor means which monitors a state of another elemental object belonging to the same aggregate object as the state-held elemental object (column 3, lines 13-20), and state change means which changes a state of an elemental object when a state of another elemental object which has a predetermined relationship with the elemental object has changed (column 3, lines 32-40; Table 1). Schill also discloses wherein the state change means of the state change propagation means changes the state of the elemental object after a given time has elapsed from the state change of another elemental object (column 3, lines 32-40; column 4, lines 26-50; Table 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Gibson by including state change propagation means wherein at least on elemental object has the state change propagation means as taught by Schill. The suggestion/motivation for doing so would have been because it would achieve correct propagation of information in inhomogeneous material which is important in virtual reality applications such as surgical simulation (Schill, column 1, lines 48-60) an area to which the system of Gibson is directed (Gibson, column 3, lines 17-23).

4. Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson in view of Schill further in view of Oka as applied to claim 1 above further in view of Mazarak et al., "Animating Exploding Objects" (Mazarak).

b. Referring to claim 11, the modified system of Gibson as applied to claim 1 does not explicitly disclose wherein an image of the aggregate object is generated as an image of a single object before the occurrence of an event, and the image is generated as an image of the aggregate object formed by a plurality of elemental objects after the occurrence of an event. Mazarak discloses the aforementioned limitation (Figs. 5-1 and 5-2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the system of Gibson by generating an image of aggregate object as a single object before the occurrence of an event, and the image is generated as an image of the aggregate object formed by a plurality of elemental objects after the occurrence of an event as taught by Mazarak. The suggestion/motivation for doing so would have been because it would produce physically accurate simulations of deformations of an object when a force is applied to object represented using linked volumetric objects (Mazarak, column 1, paragraph 3 – column 2, paragraph 2) and the invention of Gibson is directed to simulation of deformation of objects represented using linked volumetric objects (column 3, lines 32-42).

c. Program claim 22 recite steps performed by apparatus claim 11; therefore they are similar in scope and are rejected under the same rationale.

5. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson in view of Schill further in view of Oka as applied to claim 1 further in view of U.S. Patent No. 5,261,041 to Susman.

a. Referring to claim 9, the modified system of Gibson does not explicitly disclose wherein a plurality of state change patterns are provided for the elemental objects, and an image of the changed elemental object is generated in accordance with a state change pattern selected from the plurality of state change patterns. Susman discloses the aforementioned limitation (column 1, lines 37-40 and column 18, line 49- column 19, line 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of O'Brien by including a plurality of state change patterns and generating an elemental object in accordance with the aforementioned plurality of state change patterns as taught by Susman. The suggestion/motivation for doing so would have been to efficiently generate and manipulate animated objects in a computer controlled environment (Susman, column 4, lines 61-65), to achieve real-time performance, increase ease of use, make the animation system extensible, provide hardware independence, and allow data interchangeability (Susman, column 5, lines 15-68).

b. Program claim 20 recites steps performed by apparatus claim 9; therefore they are similar in scope and are rejected under the same rationale.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**. The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
07 June 2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600